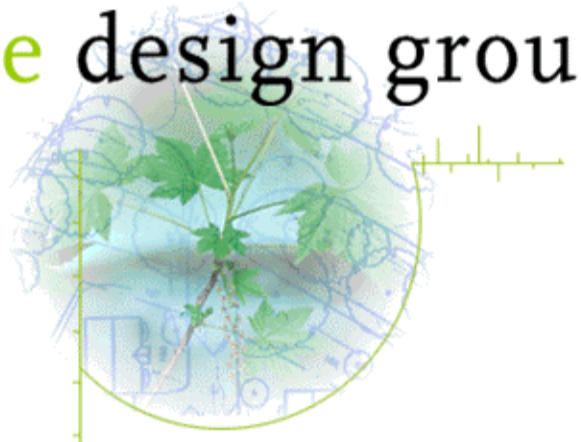
sustainable design group



To promote sustainable design at NBBJ

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Why Sustainable Design?

Trends:

- **Increasing resource depletion**

  The amount of oil used in the last 100 years is equal to the amount of known reserves….(SA)

  China is losing 1,000 square miles to desert each year….(ENN)

  Increasing costs for energy

- **Large waste by products**

  Hospitals produce 6,600 tons of waste a day…(EPA)

- **Pollution**

  The costs of climate change will reach $300 billion annually….(ENN)

  2000 was the sixth hottest year on record….(ENN)

- **Social equity**

  5% of the worlds population use 30% of the worlds resources

Buildings account for 36% of primary energy consumption…(EIA)

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Resource Consumption in Medical Facilities

Initial Consumption:

- **Expensive to build - $250 - $350 / SF**
- **Rapid obsolesence**

Ongoing Consumption:

- **High resource consumption over time.**
  - **Equipment intensive; supply intensive.**
- **High energy consumption. 2-3 x commercial buildings.**
- **Generates large amounts of waste - 6,600 tons/ day**
  - **Medical waste**
  - **Hazardous waste**
  - **Normal waste**
  - **Renovation & construction debris**

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Healthy Buildings = Healthy Communities

Environment should do no harm:

- **Infectious diseases**
- **IAQ problems – odors, CO/ fume intrusion, air changes, temperature**
- **Safety and security**
- **Traffic and neighborhood impact**

Environment should be a healing place:

- **Inviting & comfortable.**
- **Appropriate for activities.**
- **Incorporate nature – views, landscaping, materials.**
- **Offer opportunities for respite, privacy and quiet.**

Create unique spaces and experiences.

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Healthy Buildings = Healthy Communities

Sustainable Design Initiatives for Health Care Facilities

- **USGBC – LEED program – *Leadership in Energy and Environmental Design***

- **EPA – Energy Star Buildings**

  An opportunity to improve the energy performance of facilities and significantly reduce operating expenses

- **H2E – EPA/ AHA – *Hospitals for a Healthy Environment***

  Goals are to eliminate mercury from health care by 2005 and reduce the total volume of waste generated by 50 % by 2010.

- **European Energy 2000 Program –**

  10 year effort to reduce energy consumption by 20%

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EPA – Energy Star Program

- **Voluntary**
- **5 Step process to improve energy efficiency**
- **Starts with improving lighting efficiency**
  (former Green Lights Program)
- **Provides for energy use benchmarking**
- **Provides tools, advice, financing option, etc.**
- **Over 800 hospitals have signed up for the program**
  Since 1991, ENERGY STAR Healthcare partners have saved over $200 million on utility bills while preventing millions of tons of pollutants linked to respiratory diseases, acid rain, and climate change.

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EPA – Energy Star Program

- ***Kaiser Permanente – Northern California –***

  Upgrading the lighting in 129 buildings resulted in 23% reduction in electrical costs.

- ***Columbia/ HCA implemented lighting upgrades in 100 buildings***

  At $27m with an annual savings of $7.8m or 35% IRR.

- ***St. Charles Hospital – Bend Oregon –***

  Energy Star – reduced energy use by 38%

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Planning for Sustainable Design

Strategy: *The right facilities in the right place when needed.*

100+year decisions

- **Site selection**
- **Floor to floor heights**

30+/- year decisions

- **Mechanical infrastructure**

10-20 year decisions

- **First occupancy – interior fit out**

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Planning for Sustainable Design

Strategy: ***Plan for Phased Replacement and Growth***

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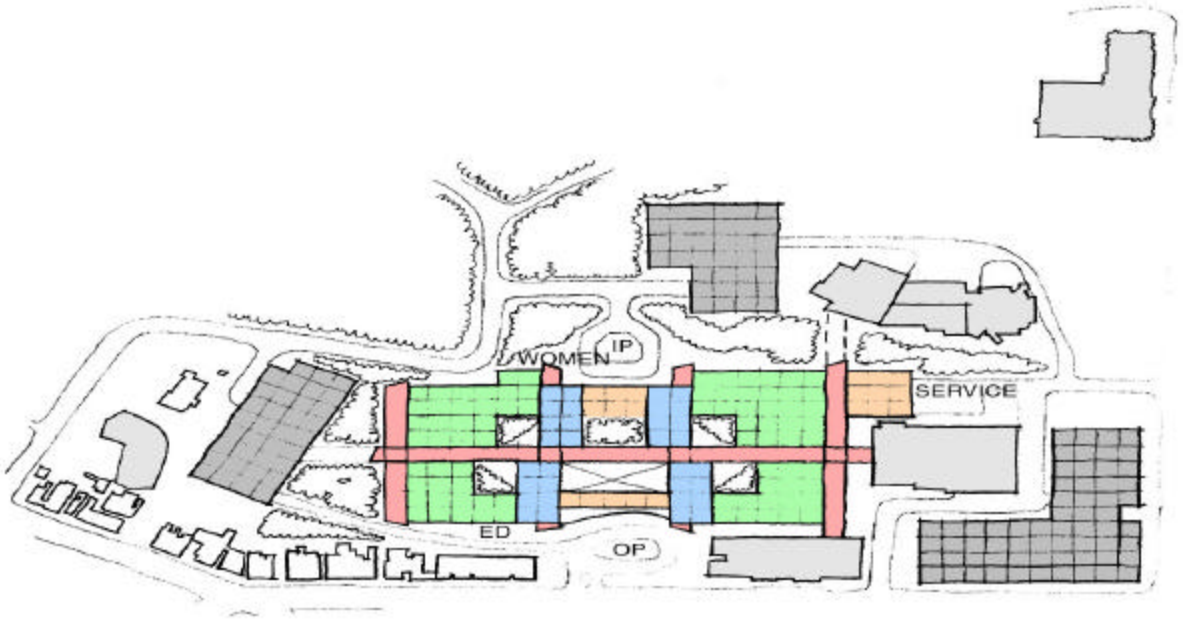
Planning for Sustainable Design

Strategy: ***Plan for Phased Replacement and Growth***



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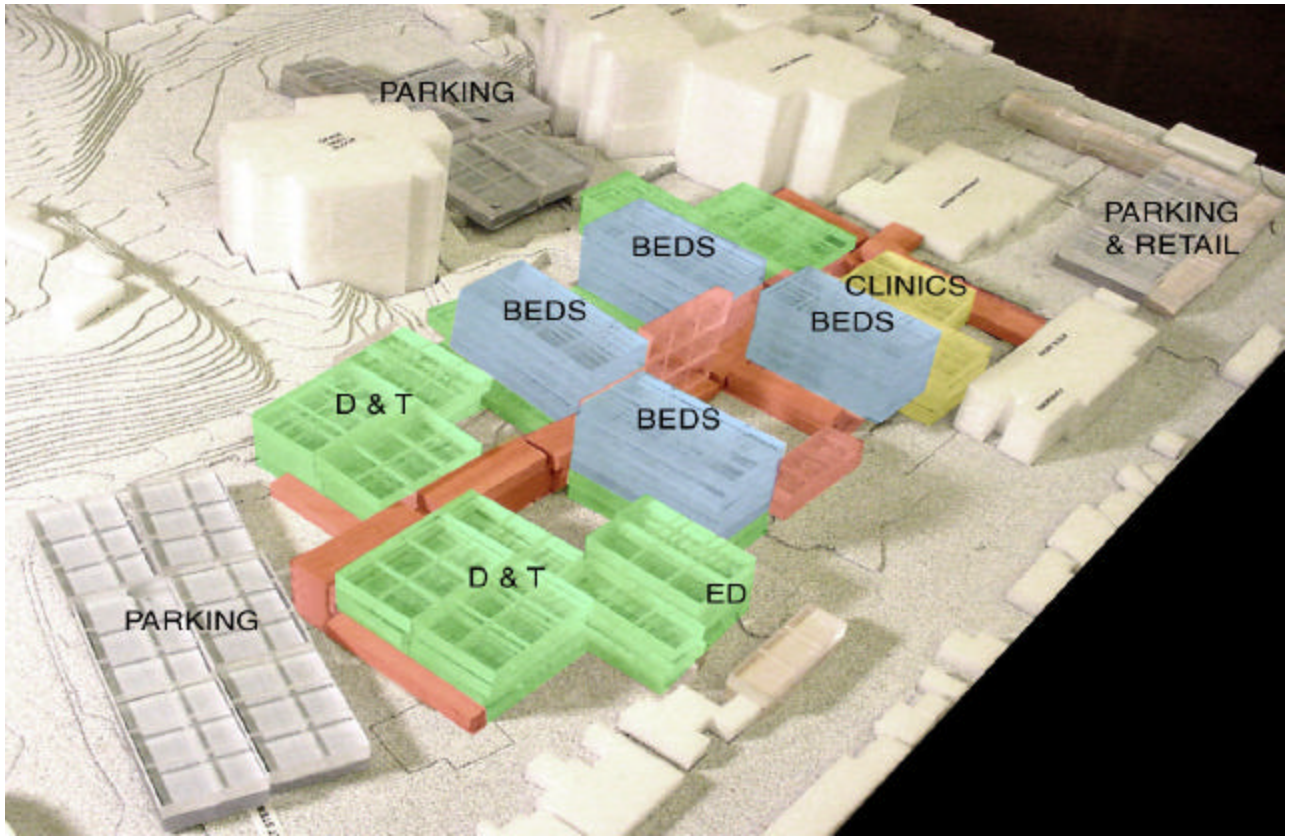
Planning for Sustainable Design

Strategy: *Plan for Phased Replacement and Growth*



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Planning for Sustainable Design

Strategy: Plan to avoid early obsolescence

- ***Premature obsolescence = waste***

Building Obsolescence factors:

Building size/ shape

- **Good – large, regular floor plates**
- **Bad – narrow, irregular floor plates**

Structure:

- **Good – Oversized to anticipate future code changes**
- **Bad – Limited provision for future.**

Structure:

- **Good – Regular structural grids, long spans, clear space.**
- **Bad – Irregular structural grids, short spans, shear walls.**

Structure:

- **Good – Higher floor-to-floor dimensions.**
- **Bad – 12-13’ or less floor-to-floor dimensions.**

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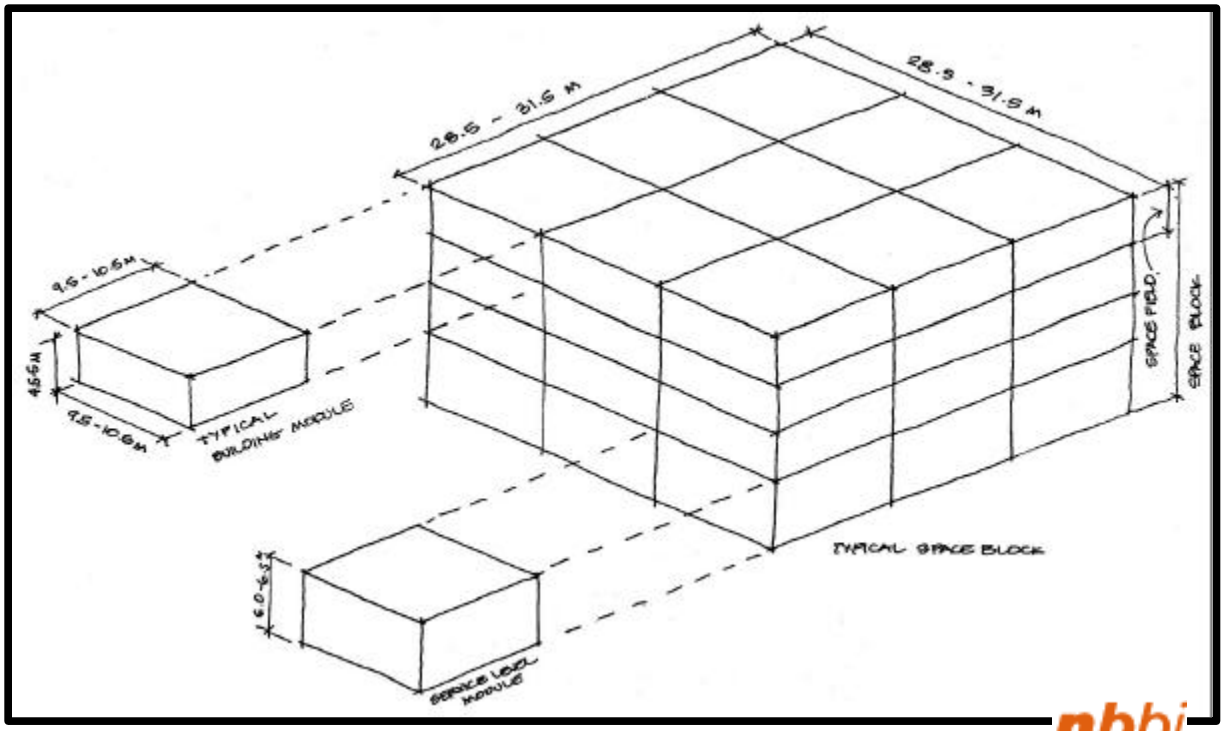
Planning for Sustainable Design

Strategy: Adopt a “Universal Planning Module”

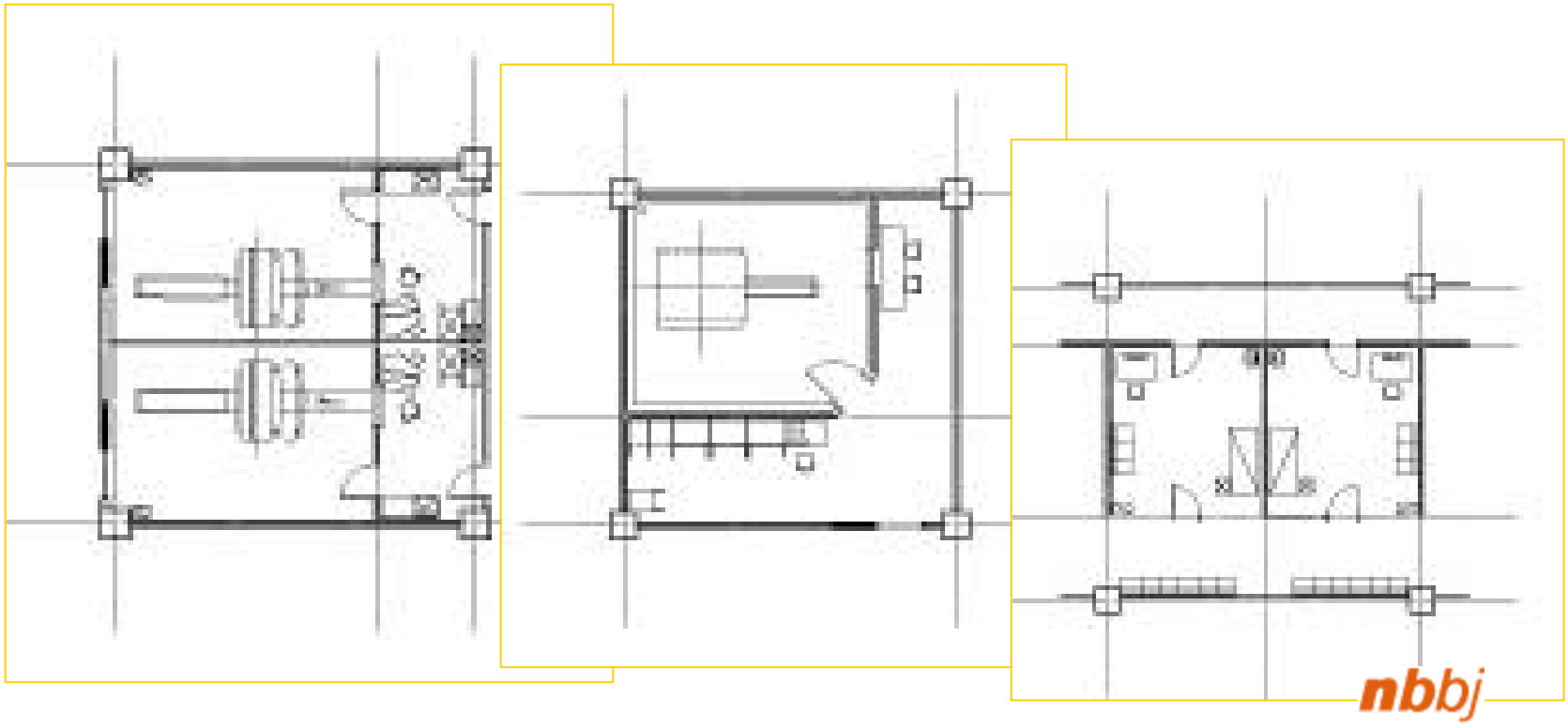
- **Space field**



Planning for Sustainable Design

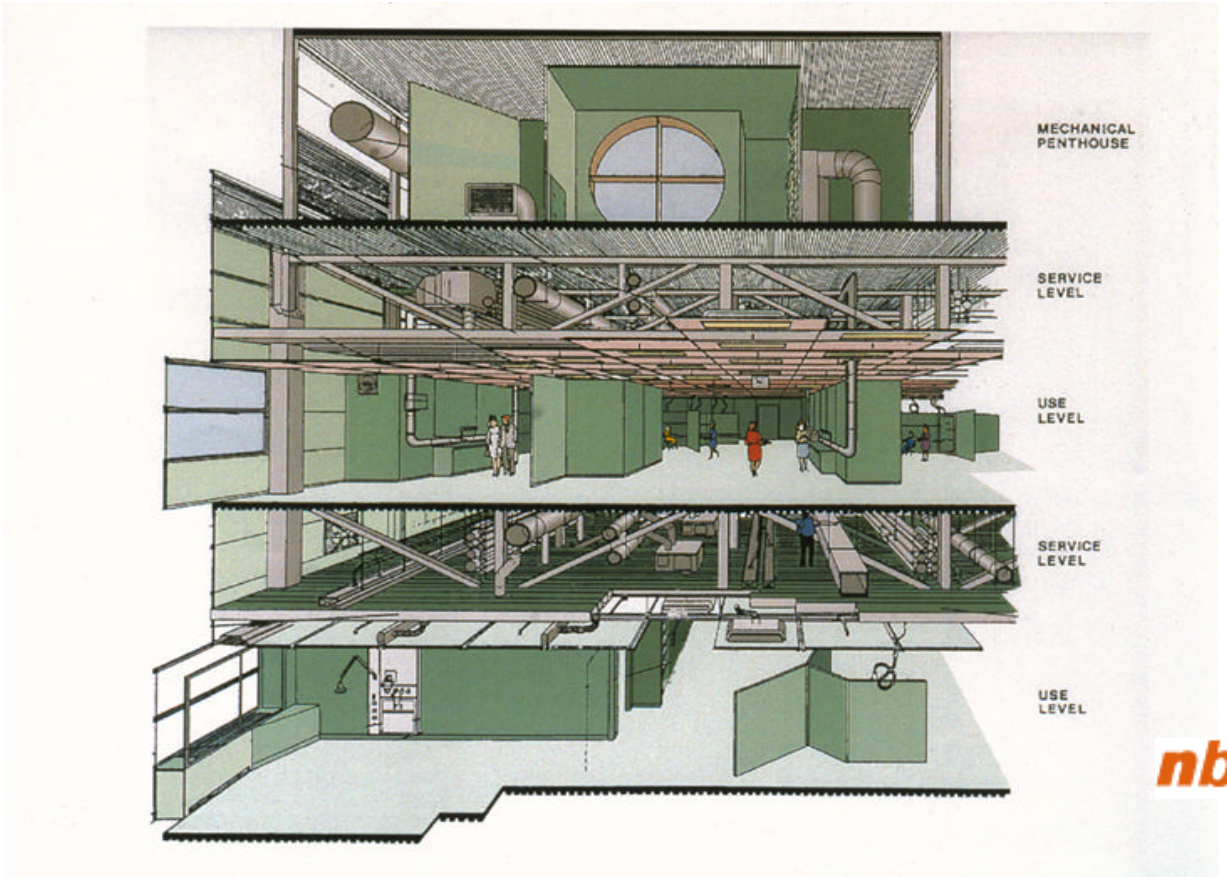
Strategy: Adopt a “Universal Planning Module”

- **Universal Building Module**



Planning for Sustainable Design

Strategy: Utilize an Integrated Building Systems Approach



Planning for Sustainable Design

Planning Strategies Summary

Plan for short term and long term needs

- initial + future potential occupancies

Loose Fit vs. Tight Fit planning

Utilize “Universal” planning guidelines

Design for sustainable operations

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Planning for Sustainable Design

Hospital Of The Future:

Need Facility Design That…

Facilitates Change

Is Affordable In First Cost

Is Effective Long-Term

Contributes To Healing

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